Declaration under 37 C.F.R § 132

#16

This declaration is submitted in support of factual statements made in the accompanying Amendment.

1. My name is Dr. Achim Grefenstein and my residence is D-67122 Altrip, Federal Republic of Germany.

2. I am a named inventor of U.S. Patent Application Serial No. 08/987775 filed September 12, 1997.

3. I am employed by BASF AKTIENGESELLSCHAFT, Ludwigshafen, FRG.

4. I hold a Ph.D. degree in Mechanical Engineering from the University of Aachen which was awarded in 1994. In total, I have approximately 8 years experience in work relating to thermoplastic molding compositions and films and (co)extrusion thereof.

5 I note that by extruding polymers into films an orientation is induced in the polymers. Due to microscopic anisotropy of the polymer melt and the flow of the highly viscous melt through the extrusion die an orientation of the polymer chains is induced that is leading to an anisotropy of the material properties. Not only the polymer chains can be oriented. Especially rubber modified polymers like ASA are containing rubber particles that are stretched in extrusion direction. This can be shown by microscopic REM-photographs. This orientation may only partly relax after leaving the extrusion die, so that some orientation remains in the extruded polymer films. This is especially true for the laminated sheets or films obtained by (co)extruding the layers A and B and, if used, C and/or D as disclosed in U.S. Patent Application Serial No. 08/987775. Thus, the extruded laminated polymer sheets or films according to the U.S. patent application are oriented sheets or films since orientation remains in the

(co)extruded sheets or films. This is evidenced by the fact that the sheets or films show some degree of shrinking upon heating, because of the orientation introduced by the extrusion process.

I have performed shrinkage measurements according to DIN EN ISO 15015 on extruded polymer sheets of ASA/PC-blends as a substrate layer and PMMA as a transparent top layer. The ASA/PC substrate layer had a thickness of 1.15 mm, whereas the PMMA top layer had a thickness of 0.15 mm. The shrinkage in the longitudinal direction (extrusion direction) was between 20 and 40 % when measured at 170°C for 20 minutes.

For a different laminated sheet consisting of 0,9 mm ASA substrate layer and 0,1 mm PMMA top layer a longitudinal shrinkage (in extrusion direction) of 30% was measured. The elongation perpendicular to the extrusion direction was 3 %. When the substrate layer was colored using carbon black the shrinkage in extrusion direction was 22% and perpendicular 1%, respectively. The measurements were performed at 170°C over 20 minutes.

In a different system, 0,9 mm ASA/PC substrate layer and 0,1 mm PMMA top layer were employed. The shrinkage in extrusion direction was 27 % and in perpendicular direction the elongation was 5 %. The ASA/PC blend was composed of 40% ASA and 60% polycarbonate. A different system employed an ASA substrate layer, a HI-PMMA intermediate layer containing a green dye and a PMMA top layer. The overall layer thickness was 1,0 mm. The shrinkage in extrusion direction was 36%, in perpendicular direction we observed an elongation of 19%.

A different system employed a 0,80 mm ASA substrate layer and a 0,05 mm PMMA top layer. The substrate layer contained a red dye. The shrinkage in extrusion direction was 40%, in perpendicular direction an elongation of 7%. All these measurements were performed at 170°C for 20 minutes.

The above results show that the (co)extruded laminated sheets or films according to the present invention are oriented which is evidenced by the shrinkage behaviour upon heating at 170° C for 20 minutes.

The experimental results support the above general finding.

Sometimes in the literature also extruded films are described as being unoriented. In these circumstances the term "unoriented" is usually employed to distinguish these films from stretched or drawn films which are cold drawn or stretched after the initial extrusion. The cold drawing or stretching results in a larger additional orientation which leads to very high shrinkage rate. These films are usually denoted as heat-shrinkable films. Thus, these references usually use the terms "oriented" and "non-oriented" to distinguish heat-shrinkable films which have been cold drawn or stretched and films which were not cold-drawn. The latter, however, show a significant degree of orientation and shrinkage as it was shown above. Thus, the language "unoriented extruded film" used in some prior art references is misleading.

6. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

By .....

Dated: 30. August 2001